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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/665,177	09/19/2000	Takashi Shiraishi	016907/1143	4823

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FOLEY AND LARDNER  
SUITE 500  
3000 K STREET NW  
WASHINGTON, DC 20007

EXAMINER

PHAM, HAI CHI

ART UNIT	PAPER NUMBER
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2861

DATE MAILED: 06/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n No.

09/665,177

Applicant(s)

SHIRAISHI ET AL.

Examiner

Hai C Pham

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 4-10 and 12-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-7 is/are allowed.
- 6) ☒ Claim(s) 4, 8-10 and 12-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Allowable Subject Matter***

1. The indicated allowability of claims 8-10, 12-13, 17-18 is withdrawn in view of the newly discovered reference to Iizuka (U.S. 6,104,521). Rejections based on the newly cited reference follow.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 4, 8-10, 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iizuka (U.S. 6,104,521) in view of Shiraishi et al. (U.S. 5,159,193).

Iizuka discloses a scanning optical system comprising a light source (13), a forwardly deflecting optical set (first optical system including a first lens (collimator lens 14) for providing light beams from said light source with a predetermined characteristic (collimated light beams), a second lens (hybrid lens 115H) for converging said light beams from said first lens onto the vicinity of the polygon mirror unit (12), which deflects the light beams from said forwardly deflecting optical set into a second direction (main scanning direction) substantially perpendicular to the first direction, and a third lens

Art Unit: 2861

(second optical system 420, which is a  $f-\theta$  scanning lens) for forming the light beams deflected by said polygon mirror unit as an image onto a predetermined image surface (16) at substantially equal speed (an inherent characteristic of a typical  $f-\theta$  scanning lens).

With regard to claims 4, 8, 12, 15, 17, Iizuka teaches the second lens (115H) being a hybrid lens having a resin lens (118) and a glass lens (117), the glass lens having different magnification in the main and the sub-scanning directions, and the resin lens (118) having a surface (115b, Figs. 42-43) whose radius of curvature in the main scanning direction is varied along the sub-scanning direction (the surface 115b having a sub-scanning-plane aspherical surface) (col. 23, lines 59-67 and col. 26, lines 9-15).

With regard to claim 9, Iizuka teaches the second lens (115H) being a hybrid lens having a resin lens (118) and a glass lens (117), the glass lens having different magnification in the main and the sub-scanning directions, and the resin lens (118) having a surface (115b, Figs. 42-43) whose radius of curvature in the sub-scanning direction is varied along the main scanning direction (the surface 115b having a main-scanning-plane parallel to the main scanning direction Y while having a sub-scanning-plane aspherical surface) (Figs. 42-43).

With regard to claims 10, 13, Iizuka teaches the second lens (115H) being a hybrid lens having a resin lens (118) and a glass lens (117), the glass lens having different magnification in the main and the sub-scanning directions, and the resin lens (118) having a surface (115b, Figs. 42-43) whose radius of curvature in the main

Art Unit: 2861

scanning direction is varied along the main scanning direction (the surface 115b having a main-scanning-plane parallel to the main scanning direction Y) (Figs. 42 and 21).

However, Iizuka fails to explicitly disclose the second lens converging the light beams from the first lens in the sub-scanning direction, the third having a positive power in the main scanning direction, and the transferring apparatus.

Nevertheless, Shiraishi et al. discloses an image forming apparatus comprising an optical device, which includes a light source (12), a forwardly deflecting optical set including a first lens (collimator lens 14) for providing light beams from said light source with a predetermined characteristic (collimated light beams), a second lens (16) for converging said light beams from said first lens in a first direction (sub-scanning direction) (col. 5, lines 43-51), a polygon mirror unit (66) for deflecting the light beams from said forwardly deflecting optical set into a second direction (main scanning direction) substantially perpendicular to the first direction, and a third lens (imaging lens set 70) for forming the light beams deflected by said polygon mirror unit as an image onto a predetermined image surface (of the photosensitive body 90) at substantially equal speed (col. 3, lines 29-34), wherein said third lens has a positive power in the second direction (col. 4, lines 37-60), and said second lens has a power in the second direction (the plastic lens 16 having negative power in the main scanning direction) (col. 4, lines 4-8), a photoreceptor drum (rotating photosensitive body 90), which receives said light from said optical scanning device, and a transferring apparatus (not shown), which transfers a toner image on said photoreceptor drum to a medium (not shown) (col. 3, lines 50-56).

Art Unit: 2861

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Iizuka with the aforementioned teachings of Shiraishi et al. The motivation for doing so would have been to provide a focused beam on the surface of the polygon mirror thus allowing the imaging beam spot focused on the surface to be scanned.

***Allowable Subject Matter***

4. Claims 5-7 are allowed.

5. The following is an examiner's statement of reasons for allowance: the primary reason for the indication of the allowability of the claimed invention, with respect to claims 5-7, is the inclusion of the limitation, in the combination as currently claimed, that:

- the second lens includes a resin lens and a convex glass lens, the resin lens having a projection abutting in the direction of the convex surface of the glass lens (claims 5, 6),
- the second lens includes a resin lens and a convex glass lens, and a deformable sheet of constant thickness is provided between the resin lens and the glass lens (claim 7),.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Art Unit: 2861

***Response to Arguments***

6. Applicant's arguments with respect to claims 4, 8-10, 12-18 have been considered but are moot in view of the new ground of rejection as presented in this Office action.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin R. Fuller can be reached on (703) 308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722, (703) 308-7724, (703) 308-7382, (703) 305-3431, (703) 305-3432 for regular communications and for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



HAI PHAM  
PRIMARY EXAMINER

June 3, 2003